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ON NEURASTHENIA AS A DISINTEGRATION OF PERSONALITY.

BY JOHN E. DONLEY, M.D., PROVIDENCE.

Physician for Nervous Diseases, St. Joseph's Hospital.

To those who have studied neurasthenia in its multiform variations, and have attempted to penetrate beneath the surface of its purely phenomenal manifestations, the inadequacy of present conceptions regarding it must have become apparent. And this inadequacy must have been rendered doubly impressive when the attempt has been made in actual practice to identify the living, breathing patient before us with the abstract, inanimate descriptions of him current in the textbooks. Having listened to the story of his thousand ills, and having catalogued him in the conventional fashion, we cannot but have experienced the feeling, vague it may be, but none the less real, that somehow we had not gotten to the root of the matter, that there was an intangible something which had eluded us, and which may have been, we suspect, the very essence of the thing we were seeking to fathom. Such a feeling, when one reflects upon it, must be not uncommon, and has led to the present attempt to take a wider survey of the subject and to bring to its discussion certain of the facts and principles which the more recent psychology has furnished. It is, perhaps, a sufficient commentary upon the futility of the purely anatomical conception of neurasthenia to note that its only contribution to the pathology of the disease consists in the rather apologetic reproduction of some illustrations of nerve cells in a state of fatigue, —

studies inaugurated some years ago by Hodge. Regarding the phenomena, as phenomena, I shall have little concern, but shall endeavor to go behind them, and to study them from the point of view of their interpretation. I wish to discuss the functional theory of neurasthenia,[1] having for my purpose to show that it is in reality one in kind, though, of course, different in degree, with hysteria, multiple personality, and other types of dissociated consciousness; that it is, in a word, a condition of disintegrated personality.

The mere enunciation of such a theory may possibly appear to many to be unduly novel and to savor strongly of metaphysics, hence, to surrender that intimate dependence upon empirical fact so dear to the modern medical mind. But upon further consideration it will be obvious that this conception not only does not forsake experience, but that rather it has to offer an interpretation of the facts of experience which would seem to be more philosophic and more practically useful than any which has hitherto been suggested.

Since in the discussion which follows we are about to approximate more closely certain clinical types of disease, hitherto more or less distinct, since, furthermore, in maintaining that they are in truth but varied and particular expressions of the working of one fundamental psychophysiological principle, we are leaving the beaten path, it may be well if first we disabuse our minds of some traditional notions. As every one knows, the words we employ to denote abnormal conditions of mind or body have been transmitted to us in large part as an heritage, and to these words custom has attached a more or less definite, distinct meaning. It is not, therefore, surprising that unless we

[1] For an able presentation of the functional conception of nervous phenomena see, "The Value of the Physiological Principle in the Study of Neurology," James J. Putnam, M.D., *Boston Medical and Surgical Journal*, December 15, 1904; also, "The Problem of Psychiatry in the Functional Psychoses," Edward Cowles, M.D., *American Journal of Insanity*, Vol. LXII, October, 1905.

The recent work of J. Grasset, *Les Centres Nerveux*, Paris, 1905, treats the whole subject of neurology from the functional point of view.

are forewarned we are prone to take it for granted that different names signify in reality different things, the more so if authority in matters medical lends its weight to such belief. Thus does our thinking become permeated with a fallacy which makes it difficult to alter our opinions, and to perceive that despite a difference in nomenclature there may be an essential identity in the actual things in themselves. This has been shown to be true by Myers, Janet, Prince, Sidis, Breuer and Freud, and others, as regards hysteria and multiple personality; there is reason to believe it can be shown to be true as regards neurasthenia also.

It may be said, I think, without fear of dissent, that there is no word used in medicine which has been so loosely and withal so vaguely applied as this very word, " neurasthenia," — a fact in itself suggestive of a certain mental haziness regarding it. But the point to which attention should be particularly directed is this, namely: that, influenced by the mechanical symbolism of the day, and actuated by the belief that for every pathological manifestation there must be an underlying, definite " disease-process," many of us have come to look upon neurasthenia as a distinct, more or less stereotyped morbid entity, having an uniform symptomatic expression. Such a view is, I am sure, altogether erroneous; for neurasthenia, in any adequate conception of it, is not, and indeed, in the very nature of things, cannot be, a stereotyped affair like this, — a sort of pathological picture, each copy of which is identical with every other. It is a name used to describe a condition in which constantly varying factors produce a constantly varied result; or, to put it another way, a condition of psychological and physiological instability whose outward and visible sign is the neurasthenic symptom-complex. And just as every man has his own individual personality, so it may be said that every man has his own neurasthenia, which is nothing more or less than this same personality under altered conditions.

The problem of neurasthenia being, then, the problem of personality in a state of disintegration, it becomes nec-

essary to describe what is to be understood as constituting personality, and having done this, to show how its disintegration will have objective expression in the group of symptoms called "neurasthenia." It may be said at once, by way of reassurance, that by personality I do not mean a mere verbal abstraction existing in some metaphysical brain, but I do mean that living, unitary, self-conscious, mind-body mechanism which brings us in relation with the outer world of men and things and which we call "myself." Now personality in this empirical descriptive sense is a very complex product in whose elaboration many factors play their parts. Let us study these factors briefly, and to make the matter clear, let us take a concrete example. We will assume a man in the vigor of health who is living content and happy in a perfect community, — some modern Utopia. What constitutes his health and what makes him content and happy? Evidently there are two aspects to the problem: first, his own subjective feeling of comfort, stability, and power; and secondly, the agreeable, easy action and reaction taking place constantly between himself and his environment. As the psycho-physiological fundament of this feeling of comfort and power we find the great group of organic sensations, which are marked by the absence in the individual sensations of definite and local character. In Höffding's description of them the organic sensations "are lost in a general feeling of comfort or discomfort which, as it were, constitutes the result in the brain of the excitations received from different parts of the organism. We have here a feeling of our existence in general and of the general course of the vital processes. The property and quantity of the blood, the vigor of the circulation, the tension of the fibers (the tonicity), the abundant or scanty secretions of the glands, the relaxation or tension of the muscles (voluntary and involuntary), the quick or labored respiration, the normal or abnormal process of digestion, — these all help to determine it without any one of them having occasion to stand out alone. The general sensations constitute a chaos which receives its

stamp through the contrast between comfort and discomfort, and the special variations which are from the nature of the case determined by some one organ playing an especially prominent part without being always expressly known to consciousness as the source of the sensation." [1]

The fundamental mood produced by the pleasurable flow of the organic sensations is one of freedom, energy, comfort, — in a word a normal cenesthesis, such a feeling as once caused a reclaimed neurasthenic patient of mine to exclaim, " I feel as though I could annihilate a regiment! " On the other hand, any disturbance of these organic sensations will result in feelings of anxiety, fear, helplessness, and discomfort. Filled as we assume with the feeling of well-being, — a normal inner life, — our Utopian finds that when he approaches his environment, the outer life of relation, he is able to adapt himself to it with facility, both because of his subjective stability, and because this environment in the ideas, sensations, and emotions which it evokes is agreeable, making no demands which he is not able to supply, and furnishing him with conscious material whose feeling tone is pleasurable. His personality, therefore, composed of a unitary synthesis of diverse elements, is characterized by what I may term an adaptive stability, by reason of which it is able to consummate the myriad demands made upon it from hour to hour, and from day to day. Now each adaptation requires a rearrangement, possibly also an augmentation of conscious content, what Sidis has called a different " moment-consciousness "; and hence there results a constant ebb and flow, certain psychic elements dropping below the threshold of the personal consciousness, while others rise to enter into the new conscious state. In the language of recent psychology, what was supraliminal has become subliminal, subconscious, or, better, dissociated. Thus in the normal personality, by which is meant a personality psychologically and physiologically adapted and adaptable to its environment,

[1] *Outlines of Psychology*, Harold Höffding, New York, 1904. *Les Sensations Internes*, H. Beaunis, Paris, 1889.

there is a continuous process of integration and disintegration, of synthesis and katalysis, which is carried on without friction or any marked evidence of instability. A man in this condition is in the platonic state of *mens sana in corpore sano;* he is or should be an optimist, and we describe him as being possessed of perfect health.

Thus far we have considered personality in its genesis and have looked upon it as adaptable to its environment. If now we return again to our Utopian and observe the actual process of this adaptation we come upon a series of phenomena which are still consonant with health, but which under certain conditions pass over into disease. I refer to the phenomena of fatigue. The series of events produced by bodily and mental fatigue is an excellent illustration of the disintegration of personality, the weakening of psychological synthesis in a state of health. Fatigue is more than muscular and cerebral exhaustion due to the depressing influence of toxic products of activity. Such may very well be, and indeed, according to our best knowledge, really is, the physiological substratum; but this view of it as an interpretation is altogether incomplete unless we go further and include its psychological aspect, its affect upon consciousness. And here again, as in so many other instances, the impossibility of separating a living man into mind and body asserts itself. The separation, if made at all, should be understood as being merely methodological, since it has no objective justification. A physical change as being merely physical cannot produce any effect unless it acts upon a conscious being, and consequently physical changes are in their last analysis psychical; they necessarily affect personality in the sense we have already described. Ask our Utopian what are the conscious results of his daily activity and he will answer, "I feel tired and weary; I experience a sense of general discomfort; my head aches, my appetite is poor, my memory unreliable; my mind has lost its grasp upon reality and I find difficulty in concentrating attention for long upon what I am doing. Little things trouble me and I am irritable, while it seems to me I have

not the energy or volition to do things as well as when I am not fagged out." All this is true, and while the symptoms of fatigue will vary in different persons and in the same person at different times, the explanation is probably to be sought in diversities of anatomical structure, which will, of course, eventuate in varieties of physiological and psychological expression. As Sir William Gowers remarks, " Precise observation is, however, much baffled by variations in the sensory susceptibility of individuals. It is probable that these depend upon differences in the actual constitution of the nervous tissue, — more minute than we can well conceive and yet causing effects that are obtrusive. In different persons there may exist diversities of tissue which give rise to great differences in the products of action, rendering these much more harmful in one person than in another. The same diversity may render the sensory structures far more prone to disturbances and to more distressing disturbances. Thus an original variation which, if it could be discerned, would be minute beyond conception, may entail a profound difference in ultimate effect. Such considerations may help us to conceive the way in which the effects of fatigue are manifested, although they constitute little addition to our knowledge.[1]

Dr. Gowers here enunciates the anatomical variations underlying the phenomena of fatigue, and upon this hypothesis he explains the difference in results observed in consciousness or, as we would express it, upon personality. These results are those of disintegration and weakened synthesis. Fatigue, whatever its anatomical or chemical cause may be, is psychologically a feeling of exhaustion and discomfort; and this brings it under the rubric of the great class of organic sensations whose part in the formation of personality we have seen to be very great. Given this perturbation of organic sensibility, we can very well conceive how the intellectual, emotional, and volitional inefficiencies will follow, since the personality has become

[1] " Fatigue," W. R. Gowers, *Quarterly Review*, London, 1904, CC, p. 572.

unstable and so unable to make an easy adaptation to environment. So far as personality is concerned, stability stands in direct ratio to ability.

A great deal has been said in the previous pages about personality, its stability and its instability, and about weakened syntheses of consciousness. It is pertinent to inquire what is meant by these words. In the first place, we must distinguish sharply between facts and their interpretation. The former we know, the latter we speculate about, and the history of philosophy contains the record of these speculations. We do not know the intimate nature of the mechanism of stability of personality or of synthesis of consciousness, but reasoning from the facts we observe, we are compelled to postulate such a mechanism. Drawing an illustration from physical science we may compare a stable personality to a stable chemical compound, with this qualification, however, that personality is not merely passive, but also active, and that the combination of elementary psychic materials produces a unitary conscious state. Just as we believe a certain tension to exist between the atoms and molecules of a chemical compound, so we assume a certain neural tension as the physiological substrate, its psychological counterpart being stability of personality, or, in other words, a firm synthesis of conscious states. When such tension is maintained at a normal level we have a stable, healthy person; when for one cause or another this tension becomes lowered we observe its outward expression in a condition of disintegrated, unstable, weakened synthesis, which, in our view of it, is in its mildest expression, neurasthenia, and in its more intense grades, hysteria and dissociated or multiple personality.

Enough has been said, I think, about personality and its disintegration in the normal state of fatigue to enable us more clearly to comprehend what may be said about it in a condition of abnormal disintegration, namely, neurasthenia. The questions to be considered in the functional interpretation of neurasthenia are those of dissociation and automatism. Discoursing upon this subject, Dr.

Morton Prince expresses himself as follows: " Abnormal psychological phenomena, as phenomena, may be divided into two great groups, according as they are manifestations of (*a*) dissociations or weakened syntheses of conscious states, or (*b*) of automatism. These two classes (*a* and *b*) bear a reciprocal relation to one another, in that *pari passu* with the development of a weakening of the power of synthesis, or of a complete dissociation, the remaining restricted elements of the personal consciousness, or the dissociated elements, respectively, tend to take on automatic activity; as an example, take the obsessions of psychasthenia confined entirely to the personal consciousness, and the hysterical attack due to the automatic activity of dissociated (subconscious) memories of past experiences. And, *vice versa*, the development of automatism with its abnormal syntheses tends to induce dissociation, as when an artificially induced idea robs the personal consciousness of its sensory perceptions (anesthesia) or produces retrograde amnesia. Thus in any particular syndrome, such as the hysterical state, or the psychasthenic obsessions, we have combined the manifestations of dissociation or weakened synthesis with those of automatism." [1] In the particular syndrome of neurasthenia with which we are at present concerned these two processes, weakened synthesis and automatism, are found working side by side. With the lowering of psychological tension and consequent disintegration there is a tendency to the rearrangement of the unstable psychic elements after a different pattern; there is the formation of abnormal (in the sense of disagreeable) associations, the so-called " association neurosis " [2] which make life miserable for so many neurasthenics. These are the abnormal syntheses, the automatism, of which Dr. Prince speaks, and they may involve syntheses in the intellectual,

[1] " Some of the Present Problems of Abnormal Psychology," Morton Prince, M.D., *Psychological Review*, XII, p. 119.

[2] " Association Neuroses," Morton Prince, M.D., *Journal of Nervous and Mental Disease*, May, 1891. " Three Cases of Association Neuroses," John E. Donley, M.D., *Boston Medical and Surgical Journal* November 3, 1904.

emotional, volitional, sensory, or motor (musculo-motor, vaso-motor, or secreto-motor) spheres of personality, appearing either separately or in combination. The patient expresses it thus: " I feel all broken up," " I can't hold myself together," " I feel as though I would fall apart," — these feelings resulting from weakened syntheses of the personal consciousness. Again he says, " I can't get such or such an idea out of my mind," " I can't control my thoughts or feelings," " When I am alone a distressing feeling of terror comes upon me and I tremble like a leaf," —these being abnormal syntheses exhibiting automatic activity, and, because of deficient power of inhibition, incapable of being suppressed.

Neurasthenia is, then, to be looked upon as a disintegration of personality and as an effect consequent upon some causative factor, which causative factor or factors may act upon it from within or from without. In the former group of causes would be included the products of faulty metabolism, the toxins of bacteria, and such poisons as alcohol, lead, mercury, and copper; the disturbances of organic sensibility originating in disease of the various tissues and organs would be also classified here. In the second group, causes acting from without, we would include all those factors which produce their effect directly upon consciousness, and here we find the important class of emotions, such, for example, as terror and fright (traumatic neuroses), anxiety and fear. Whether acted upon from within or from without, or, as frequently happens, from both sides together, the effect is the same, first, a lowering of neural tension, and secondly, as a result of this, a condition of psychological instability and automatism; briefly, neurasthenia.

Pursuing our original purpose of studying personality objectively, let us return again to our Utopian. And to the end that we may not complicate description by the introduction of too many examples at one time, let us relate biographically, as being his, the experiences of a patient actually under observation at the present time.

After several years of ecclesiastical professional work, extraordinary in its variety and extent, he suffered a severe nervous breakdown and has been a victim of neurasthenia ever since. There are the usual periods of severe mental and physical exhaustion, intermingled with days of comparative, though not complete, comfort. Muscular fatigue, psychasthenic obsessions of homicidal import, morbid fears of possible insanity, vaso-motor flushing over the whole body, a " corkscrew " sensation arising in the pit of the abdomen and spreading to the head, a lack of mental concentration and grasp, together with a tendency to emotional depression and insomnia, — these are the main symptoms which, combined in various fashion from day to day, enact their several parts in this neurasthenic drama. He is continuously self-conscious and introspective; and as he very aptly expresses it, " I feel like the captain of a steamer who has to keep his eye on everything aboard ship." Like the poet who hears a voice in every brook, our patient scents disaster in every perverted sensation. As illustrating the working of an unstable personality in its endeavor to adapt itself to its environment, a social experience of his is instructive. Having accepted an invitation to dine with a friend, he set out with a great deal of trepidation and arrived at his destination feeling insecure about his ability to remain there. During the early part of the dinner he suffered from dizziness, flushings, and a general feeling of instability, while his obsessions and fears swooped down upon him with such intensity that it was with difficulty he remained at the table. Recalling to mind, however, what I had told him about neurasthenia being a disintegration of personality, in the sense we are discussing it in this paper, he decided to stick it out and to present a solid front to his obsessions, fears, and other sensations. The result was that gradually he regained a fair degree of control, so much so, indeed, that his witticisms evoked a great deal of laughter. He says that he felt like his old self again. This condition of personal stability obtained until some time later in the evening, when, in his

friend's study, the conversation turned upon certain saintly visions as being examples of subconscious mental activity. At this point the recollection of his own obsessions came to him, and immediately the same train of flushings, fears, and lack of control recurred as before; he was compelled to return home, followed, as he describes it, by " a thousand devils," who caused him a most uncomfortable night. Now, as I conceive it, there is but one explanation of this experience. It cannot be explained upon purely anatomical grounds, and must, therefore, receive a psychological interpretation as the oscillations of an unstable personality. The difficulty of adaptation to its environment caused the feelings of discomfort in the early part of the evening. With the gradual establishment of self-control, this adaptation became easier and more free; in other words, his personality had reached its highest point of stability, which it maintained until the discussion upon visions set off a train of automatic abnormal syntheses (association neuroses) whose activity resulted in the disintegration of personality which followed. With this psychological cleavage we must, of course, assume some perturbation or lowering of physical neural tension as its physiological counterpart. The same fluctuation of personal stability may be observed in certain cases of traumatic neurosis, where a neurasthenic or hysteric individual, who previous to a trial in court exhibits evident signs of disintegration, will undergo the strain of the witness stand with apparent self-control, only to go to pieces when she reaches home. No more convincing demonstration of the dependence of neurasthenic symptoms upon weakened syntheses of consciousness and automatism can be found than the case of Miss Beauchamp recorded in the recent volume of Dr. Morton Prince.[1] Miss Beauchamp was a young woman in whom several personalities became developed as the result of various causes. Each of these personalities was possessed of a different character and each exhibited a different state of health. " Not the least

[1] *The Dissociation of a Personality*, Morton Prince, M.D., Longmans, 1906.

interesting of the curious nervous phenomena manifested, are the different degrees of health enjoyed by the different personalities. One would imagine that if ill health were always based on physical alterations, each personality must have the same ailments; but such is not the case. The person known as B I has the poorest health. B IV is more robust, and is capable of mental and physical exertion without ill effects, which would be beyond the powers of B I; while B III is a stranger to an ache or pain — she does not know what illness means."[1] Here we observe these various personalities using the same body, and yet each of them presenting a different condition of health, the change from one state to another taking place sometimes in the twinkling of an eye. " Not the least remarkable of the phenomena following the transformation of B I or B IV into the real Miss Beauchamp (a synthesis of all the personalities) is the sudden disappearance of the neurasthenic state. It will be readily understood that when disintegration occurs, neurasthenic symptoms — fatigue, insomnia, and general instability — return. A suggestion of health is given to B *II*, and, with a snap of the finger, so to speak, she wakes and becomes Miss Beauchamp, buoyant with health. Such experimental phenomena have great significance in connection with the problem of neurasthenia. Neurasthenic symptoms are an expression of disintegration."

From the vantage ground of our present position, we are able more clearly to estimate the value of the different means employed in the treatment of neurasthenia. In a general way we may include them all under the groups of the physical and the psychic. If our theory of the condition be true, the exclusive use of either of these is inadequate, and as in other things, the *via media* is the proper one. It is by the combination of both these methods and their judicious adaptation to the requirements of the individual case that the best results are to be obtained. Many of the failures in the treatment of neurasthenia are due to the exclusive use of physical or of psychic methods;

[1] Prince: *loc. cit.*, p. 17.

or, if used in combination, to their improper employment in a given case. Obviously it is useless, so far as results are concerned, to prescribe glycerophosphates for a neurasthenic, if we allow him to leave our consulting room with the same ideas, emotions, and feelings with which he entered. By physical methods, we can give him a normal cenesthesis, the physiological basis of personality, but this is not enough. By psychic methods we should teach him properly to evaluate and to assimilate his conscious material, and by so doing to maintain a condition of adaptive stability in relation to his environment.

THE FEELING OF UNREALITY.

BY FREDERIC H. PACKARD, M.D.,

(McLean Hospital, Waverley, Mass.)

UNDER this head may be included all those symptoms arising from the loss of the feeling of reality, whether it be in the field of consciousness relating to the outside world or to one's own physical or mental personality. Wernicke [1] has spoken of these different fields as the allopsychic, the somatopsychic, and the autopsychic. As we shall see later, this loss of feeling of reality may be limited to one field or may extend to all three fields.

Despite the frequency of this symptom in various psychoses, very little attention has been given to it until the last few years. Its recognition is not new, however, for over thirty years ago Krieshaber [2] described cases presenting this symptom, and nearly fifteen years ago Cotard [3] described this same symptom. The authors of various textbooks on psychiatry with the exception of Wernicke have given little or no space to this symptom, or when they have considered it at all have classed it with the so-called hypochondriacal delusions.

Quite recently a considerable amount of interest has arisen concerning this symptom, and Pick, Foerster, Alter, Juliusberger, Storch, Janet, and Deny and Camus have written papers describing carefully studied cases and offering explanations of the symptom. All these cases show this feeling of unreality in one or more of the three fields mentioned. In all these cases objective examinations of the various sensations showed little. Janet,[4] who made very

[1] Wernicke: *Grundriss der Psychiatrie*, pp. 132, 133.

[2] Krieshaber: *La Névropathie Cérébro-cardiaque*, 1873.

[3] Cotard: "Du délire des négations," and "Perte de la vision mentale dans la mélancolie anxieuse," *Études sur les Maladies Cérébrales et Mentales*, Paris, 1891.

[4] Janet: "The Psycholeptic Crises," *Boston Medical and Surgical Journal*, January 26, 1905.

careful and extensive examinations in his cases, found no disorder of cutaneous, muscle, or visceral sensibility. He did find, however, a tendency on the part of the patient to neglect agreeable or painful impressions. Alter,[1] in one of his cases, found some inconstant anesthesias and analgesias. On the whole, I think it is fair to say that so far no real demonstrable disorders of organic sensations have been demonstrated.

Concerning the explanation of this symptom all agree that at the present time too little is known about it to come to any definite conclusion. However, some hypothetical explanations have been advanced. "Storch claims that the feeling of reality of external objects and the projection into space depend upon the association of muscle sensations with sense perceptions."[2] The majority of observers agree with him in this and explain these symptoms upon that basis, Foerster,[3] for example, thinking that the change is primarily in an insufficient valuation of organic sensations and secondarily in a disorder of the consciousness of the external world. Pick[4] considered it an alteration in the feeling of recognition. Janet[5] differs in his hypothesis from the others. He calls it a "psycholeptic crisis" and points out that the onset of this symptom is frequently sudden. He also mentions, in connection with these patients during the crises, what he calls the "feeling of incompletion" in regard to action, perception, and emotion: "The mind does not carry out its processes to their normal completion." In his tentative explanation of these symptoms he suggests that mental activity may be divided into two classes of operations; the first or simple one where

[1] Alter, quoted by Hoch: "A Review of Some Recent Papers upon the Loss of the Feeling of Reality and Kindred Symptoms," *Psychological Bulletin*, II, No. 7, p. 236, 1905.

[2] Hoch: *Loc. cit.*, p. 236.

[3] Foerster: "Ein Fall von Elementarer Allgemeiner Somatopsychose (Afunktion der Somatopsyche)," *Monatsschrift für Psychiatrie und Neurologie*, XIV, p. 205.

[4] Pick: "Zur Pathologie des Bekanntheitsgefühls (Bekanntheitsqualität)," *Neurologisches Centralblatt*, 1903, XXII, p. 2.

[5] Janet: *Loc. cit.*

" the operations bear upon abstract ideas, general ideas, imaginary conceptions and representations, and even upon the reproduction of past events "; the second and more difficult where the operations " bear upon events which are present and real and produce a knowledge of complex events which are actually taking place in the universe at the moment; also where they produce reactions in us which are likewise perfectly real acts, that is to say, acts capable of determining modifications in the world as it exists." The first class of mental operations is easy for two reasons: " Primarily because they are a repetition of syntheses previously achieved, and secondarily because they deal with abstract elements few in number and enormously simplified." " The second class of operations, on the contrary, is difficult not only because they demand new syntheses but particularly because they act upon rich and infinitely complex elements." Assuming this he divides psychological operations into two groups, a higher, which calls for greater tension of the nervous system and includes the functions of the real, and the lower, which calls for less tension and embraces the abstract indifferent functions bearing upon the past and the imaginary rather than upon the present and the real. When this symptom is present it is to be explained by a loss of the function of this higher group, which in turn, he says, may be ascribed to a lowering of cerebral activity.

Quite recently Hoch [1] has written an exhaustive and valuable review of the recent literature on this subject, one which entailed a large amount of critical reading. From it I have drawn freely in writing this introduction.

While the above review is incomplete, it seems adequate for the purpose of this paper since it is not so much my desire to criticise or refute what other observers have said as to offer for consideration some ideas which seem to follow the study of a case presenting this feeling of unreality. It may be said that this is only one of many similar cases which have been observed at this hospital. They have

[1] Hoch: *Loc. cit.*

shown this symptom in varying degrees of intensity, from its very mildest forms where " things do not look just right " to the most marked forms, where there is a complete " *délire de négation.*"

Besides possibly some slight diminution of pain sensation and some fleeting inability to estimate distance by sight, nothing has been observed which would point definitely to any disturbance of organic sensations.

This symptom has occurred chiefly in involution psychoses, sometimes in manic-depressive depressions, and occasionally in dementia precox.

The following is an abstract of the case referred to above:

A young woman, thirty-four years old, with no heredity, comes from a well-to-do family, has had good educational advantages, is a musician and an artist. At twelve years of age she had more or less continual pain in the back, with frequent acute attacks of severe pain which at a later period were found to be due to renal calculus. Mentally she was bright, active, perfectly normal, until twenty years of age, at which time she began to feel discouraged at being kept back in her ambitions by her physical condition. She had visited many physicians who had made as many different diagnoses of her trouble. It was finally said to be hysteria. She rather suddenly became markedly depressed, sat about unoccupied, almost without moving, face without expression, " wooden." When spoken to she would sometimes obey requests, but showed no sign in her face of having heard them. She was sent to an insane hospital. There she gradually began to move about a little more and suddenly, three months after the onset, she awoke one morning decidedly happy, began to do many things, and was very energetic, but her exhilaration did not extend much beyond what might be called normal bounds. The pain in her back continued as before, but she was well mentally until three years later when, twenty-three years of age, 1894, a second depression came on suddenly, presenting the same characteristics as the first. Unlike the first, however, it wore off very gradually and as she became a little freer in her movements and talk she expressed many depressive ideas. At the end of a year all mental symptoms had gradually disappeared, but she was not as happy as after the first attack. She resumed her normal

activity, managing household and financial affairs. In December, 1903, although relieved from the old pain by an operation performed the previous year, she felt tired physically. She could not be made to rest as she said it was only natural fatigue. Two weeks later she felt so weak and exhausted that she was persuaded to go to bed. Within an hour she suddenly got depressed, said it was as if something had suddenly struck her in the head and gone all over her, had destroyed her life, killed her mentally; she was nothing but a body without a soul. Almost at once she began to say that she could not see people as formerly. When she looked at her mother, although she did not look right, she could not say what the change was, and concluded that the trouble was with herself. For about two months she sat about motionless, with immobile face. Then for three months she cried and moaned a good deal. After this she went to the country where her slowness of movement gradually wore off and she employed herself planting, hoeing, and weeding in a garden. She talked very little except to say that she was dead mentally and could never get well. She came to the McLean Hospital in March, 1905.

She was depressed and complained of some inadequacy, but foremost of all was a feeling of unreality. She said she had lost everything. She dated it from the time she went to bed in December when she said " the crash came, and ever since then things have gone farther and farther away." Characteristic utterances were: " I am nothing but a body sitting about without a soul." " Things about are like dreams." " This place is more of a dream than the last." " Nothing seems real until I get back to the time before I went to bed." " Everything I see and hear seems unreal." " I don't see nor hear." She modified this by saying: " I don't see or hear in a way; I could walk in the streets and find my way, could recognize people whom I know and all that, but yet I can't see." " I see the trees and yet I don't see them; they don't seem real and yet I know that they must be because they are the trees I always saw." Such were some of her utterances at admission.

During the seven months which have elapsed since entrance the patient has continued depressed, expressed a good deal of inadequacy, and except for a little sewing and writing has been unable to occupy herself to any extent. She speaks of a difficulty in thinking and in the pages which she has written in attempting to analyze and describe

her condition her sentences often show confusion of thought. Foremost of all has continued this feeling of unreality, and she continues to say such things as " I cannot see, nor hear, nor smell. I heard music the other day for just the flash of a moment only to appreciate that I could not hear it. I see the flowers only to find that I have lost the power to see them. I smell the lilacs but yet I don't smell them." At another time, when made to count fingers to prove that she could see all right, she said, " Yes, I can see it, but only for the moment; I can't associate it with the past." Or again: " I see the outside of things but I can't get the spirit of them; I see with my eyes, but not with my intelligence." " It is as if I were dumb, I can't sense things." " I have lost that which gave me my comprehension and connection and which made me Miss ——." " I would be suspicious of people if I had to start out by myself now because I could not comprehend them. There's no longer any comprehension out of myself; what little is left comes out of my memory." " I can't comprehend the pattern on the carpet sufficiently to know whether it is one I like or not." Again she says, " I can't remember," and when facts were given to show that she did remember she said, " I remember with my head but not with my feelings." Again she said to the physician, " If by some miracle I should get well to-night and you should come in the morning, I would see you for the first time; I would see you with my intelligence, and my feelings would appreciate and understand you." The patient also says, " I am only a body without a soul," but more often she says that it is not her body, " I know it's good muscle, flesh, and bone, good in the physiological sense as a body, but it's not my body; this is not I." She tries to explain it figuratively by saying, " When I went to bed and the crash came, every molecule of my body was turned and twisted and changed until this thing was left." While she often says that the houses and streets and outside things look different, do not look real, she is for the most part able to correct these statements and explain them by saying the trouble is with her,— her inability to see, hear, etc.

Various tests show that the patient has no real visual or auditory disorder, and no disorder of smell. The sense of touch is unimpaired, as is the muscle sense. At times the sense of pain has seemed diminished, but this has not been consistent. Likewise, objectively, the patient's memory is good.

In addition to the above the patient showed some symptoms which I have not seen mentioned in connection with these cases and which I wish to emphasize. It was frequently noticed in conversing with the patient that from time to time she asked the physician to stop and repeat what he had said, and then would cover her eyes and apparently try to think very hard for several moments before she could understand what the statement meant. Again it was occasionally noticed that when physicians or nurses entered the room it took a moment or two for her to recognize them fully.

In this connection some simple apperception experiments were tried. The first involved the simplest kind of apperception, that of simple relation. Six cards were given to the patient upon which were written such nouns as fire, ice, etc. Six other cards were given to the patient upon which were written in red ink adjectives which obviously qualified the six nouns, as hot, cold, etc. The patient was asked to put together as rapidly as possible the nouns and adjectives which most obviously belonged together. The first set was done correctly in fifty-five seconds, the second in thirty seconds, and the third in twenty-five seconds.

Next the patient was asked to put together in a similar way cards on which were written nouns where the relation was one of comparison. Theoretically this required a slightly more complex apperception process than the first experiment. The patient did each of the three sets, twelve cards in a set, correctly in twenty-five seconds. This gain in time seemed to be due, partly at least, to the increased familiarity with the method of experiment. It may be added that the normal time had been estimated by experiment at about twelve seconds for each set.

Finally the patient was given some simple stories to read aloud, and then asked to give the gist in her own words, bringing out the point. The first story was the following: "A cowboy from Arizona came to San Francisco with his dog which he left at a dealer's while he purchased a new suit of clothes. Dressed finely, he went to the dog, whistled

to him, called him by name and patted him. But the dog would have nothing to do with him in his new hat and coat, but gave a mournful howl. Coaxing was of no effect, so the cowboy went away and donned his old garments, whereon the dog immediately showed his wild joy on seeing his master as he thought he ought to be."

She read it at a normal rate with apparently perfect understanding, but when asked to reproduce it she could not give a single sentence and explained that she would have to take it and read each sentence by itself in order to understand the individual sentences even, and added that it would take several readings to get the point of the story. She was allowed to read it as she liked, and said (reading): "'A cowboy'—[to herself]—let me see, that's one of those men out West who takes care of cows—[reading]—'A cowboy from Arizona came to San Francisco with his dog'—[to herself]—came to San Francisco, that is, he took the train and went to San Francisco and he had his dog with him. [Reading] 'A cowboy from Arizona came to San Francisco with his dog which he left at a dealer's while he purchased a new suit of clothes.'" After some moments' thinking she said, "Oh, yes; he left his dog with another man while he went to buy clothes."

In this way the patient went through the whole story, stopping and forcing up associations, repeating many times the first part and adding on point by point until finally she finished and reproduced the story as follows: "A cowboy went to a store and bought some clothes. His dog did not know him, but when he put on his old clothes the dog knew him." When she had finished, she added, "I can't get it into my head unless I visualize the thing; I can't understand it with my head; the way I got it was by seeing a man and a dog and a store."

Several other stories were tried and the patient went through the same performance. She was unable to get the point unless allowed to read it over and over again and repeat out loud various simple associations and get visual images of the different parts of the story.

From the above experiments it would seem that the patient's apperceptive function for apperceiving simple relations and even simple comparisons is still intact but works with some difficulty. When it comes to the more complex synthetic and analytic apperception as is needed in the reproduction of the stories, there is a much more marked impairment of the function, and unless a great and abnormal effort is made the stories are not understood at all. We have then what seems to be a demonstrable difficulty of apperception, and upon this I wish to lay emphasis, because of its possible relation to the feeling of unreality.

Let me say that I have tried the same experiments on a number of other patients who were equally depressed and on some who were markedly retarded even, but none of whom showed any indication of a feeling of unreality. The results were entirely different. In every case the patients were able to give the points of stories well. Even retarded ones, although often reproducing the stories very slowly, in the end brought out the point correctly.

Before going further let us consider briefly what we mean by apperception. Baldwin [1] defines it as " the process of attention in so far as it involves interaction between the presentation of the object attended to, on the one hand, and the total preceding conscious content together with preformed mental dispositions, on the other hand."

Some other psychologists differ somewhat in their definition, but, whatever differences there may be among them, all agree that for apperception the present impression must call up certain old associations and be assimilated with them. In other words, if the present impression does not call up such necessary associations from the memory *residua* there can be no apperception.

Psychology tells us further that the feeling of familiarity is a composite feeling which depends upon the affective accompaniments of the elements of the previous impression which is called up by the present perception. If the present perception does not call up these elements of the previous

[1] Baldwin: *Dictionary of Philosophy and Psychology*, I, p. 61.

impression, the affective accompaniments of these elements will be lacking and there will be no feeling of familiarity. Things which we have never seen nor heard of before look unfamiliar because they do not call up all the necessary associations. In these cases which we are considering, the unreality is in connection with things which they have seen and heard of many times. May it not be possible that when the necessary associations are not called up in connection with things with which we *know* we are familiar, the result is not a feeling of unfamiliarity but a " feeling of unreality? "

If we accept this view, it seems possible to relate a feeling of unreality to an association disorder, and since we have seen that apperception is dependent upon associations, a way is opened to relate the patient's feeling of unreality to her disorder of apperception. Thus I am led to the hypothesis that the feeling of unreality is due to a disorder of apperception, which in turn is due to an association difficulty of some kind.

Let us test such a theory by applying it to the various symptoms presented by our patient.

In the first place she has said, " I cannot see," but she modifies and explains this by saying, " I can see with my eyes but not with my intelligence." " I see it, but only for the moment; I can't associate it with the past." " I see the outside of things but I can't get the spirit of them; it is as if I were dumb; I cannot sense things." Again she said, " I have lost that which gave me my comprehension and connection and which made me Miss ——."

Are not these the very statements which one would expect from a person whose apperception was interfered with through an association disorder?

In regard to the feeling of unreality relating to the outside world our patient at times says that things look unreal, and many patients are consistent in such statements; the houses, trees, and people do not look real. Here again we get just what our psychology teaches us to expect with an apperception disorder. The sight of the houses, trees, and people does not call up the necessary associations for their

apperception, and the lack of those associations causes the feeling of unreality in regard to them. This feeling of unreality relating to the outside world is very closely related to the feeling of unreality relating to the patient's own sight, hearing, smell, etc. Indeed, it seems to me to be the same thing made subjective when patients say, " I cannot see," and made objective when they say the thing does not look real. The patient above described at times, making the trouble objective, says, " The trees do not seem real," but again, making it subjective, says, " I don't see them, " and adds, " I know they must be real because they are the trees I always saw." This same shifting from objective to subjective was noted during the earlier part of the patient's illness, when she said that her mother did not look right, but finally concluded that the trouble was with herself.

But to go back to the feeling of unreality relating to the outside world, we find that taken alone it seems possible to explain it by the above hypothesis as due to the failure of the immediate perception to call up the necessary associations. If we admit that it is the same condition as that manifested by statements " I cannot see," etc., being in one case made objective, in the other subjective, we have another reason for considering it due to the same cause.

Now, in regard to the feeling of unreality relating to the body, as, for example, when a patient says, " This is not my hand, it is not a real hand," we have a condition which may at first seem quite apart from those already discussed. It is not difficult to imagine, however, that when the hand is looked at or when attention is called to it by other than visual sensations, just as with outside things, the present impression does not call up the normal associations, in which case psychology leads us to expect a feeling of unreality or, just what we often get, " It is not a real hand." The statement, " It is not my hand," may be simply an elaboration of " It is not a real hand," or it may be a part of what I will take up later in attempting to explain the statements such as " This is not I." In the same way it is possible to explain the feeling of unreality in regard to other parts of the body.

Such an explanation at least allows the organic sensations as such to remain normal as we have shown they seem to do. Theoretically, then, we see that the feeling of unreality relating to the outside world and to the body is really the same thing and can all be explained by the same hypothesis.

A complaint which the above patient has not made, but which is quite common in such cases, and which is very pronounced in another similar case which has been under my observation, is that solid objects look flat. It is well known that as the distance of a solid object from the subject increases, the impression of solidity diminishes, so that beyond a certain distance all angles of the binocular parallax disappear and the body appears flat, *unless* the impression of that object arouses elements of earlier percepts which are assimilated with the new impression.[1] Some observations made upon the patient referred to are very interesting. When a solid object was held near enough to his face so that a different image was projected on the retina of each eye, the patient recognized that it was solid, but when held at such a distance that there was no such difference of images on the two retinæ, he said it looked flat. This was tried with several different objects with the same result. The associations necessary for the recognition of solidity did not come up as with a normal person, and consequently the objects looked flat to him. Whether or not the above hypothesis is true, it seems significant that so many of these conditions can be explained by it.

We have left to consider such statements as " This is not I." The explanation of this involves merely an extended application of our hypothesis. In the preceding considerations it had to do with the explanation of the feeling of unreality in its relation to the more concrete things, the body, the outside world, etc. Here it has to do with the feeling of unreality in its relation to a more general and complex thing, the " consciousness of self." It is still an apperception difficulty but the apperceptive elements are

[1] Wundt: *Grundriss der Psychologie*, pp. 163, 270.

vastly more complex. There is a difficulty in associating the present, taken in its larger meaning, with the past.

In speaking of such cases James says," The present thought of the patient is cognitive of both the old *me* and the new, so long as its memory holds good. Only within that objective sphere which formerly lent itself so simply to the judgment of recognition and of egoistic appropriation strange perplexities have arisen. The present and the past both seen therein will not unite." [1]

In another place he says, " Masses of new sensations hitherto foreign to the individual," etc., and then goes on: " At the outset these stand in contrast with the old familiar me, as a strange, often astonishing and abhorrent *thou*." [2]

Again he says; " One can compare the state of the patient to nothing so well as to that of a caterpillar, which, keeping all its caterpillar's ideas and remembrances, should suddenly become a butterfly with a butterfly's senses and sensations. Between the old and the new state, between the first self, that of the caterpillar, and the second self, that of the butterfly, there is a deep scission, a complete rupture. The new feelings find no anterior series to which they can knit themselves on; the patient can neither interpret nor use them; he does not recognize them; they are unknown. Hence two conclusions, the first which consists in his saying, '*I no longer am*,' the second, somewhat later, which consists in his saying, '*I am another person*.'" [3]

If we may be allowed to use a terminology somewhat different from that employed by James, the above is consistent with our own theory that " consciousness of self " depends upon a complex apperceptive process in which the present is always assimilated with the representations of the past whether these be focal or marginal in consciousness. To put it the other way around, if the present cannot be assimilated with the past there is a loss of the consciousness of self. This is just what happens in these cases showing

[1] James: *Principles of Psychology*, I, p. 378.
[2] W. Griesinger, quoted by James: *Ibid.*, p. 376.
[3] H. Taine, quoted by James: *Ibid.*

a feeling of unreality. The products of their present impressions will not fit with the past, and how can we expect them to? Things are presented to patients who have not only lost a part of their apperceptive function (as shown in the first part of our consideration), but who have to analyze this imperfect apperceptive product with an analytical machine which is also minus part of its apperceptive function. One can scarcely conceive of a more vicious circle. The products of impressions coming through such a distorted mechanism are so different from those which resulted in the past when the mental mechanism was normal that they cannot be assimilated with the past and consequently cannot be understood. Such a changed condition is comparable to the change of the caterpillar to the butterfly. The new products "find no anterior series to which they can knit themselves on," and we come logically to the same conclusions: "I no longer am." "I am another person." "This is not I."

THE VALUE OF BIOLOGICAL INTERPRETATION FOR ABNORMAL PSYCHOLOGY.

BY DR. ED. CLAPAREDE,

Director of the Psychological Laboratory, University of Geneva.

To understand the functional psychopathological phenomena and to determine their pathogenesis, it is very frequently an advantage to interpret them biologically.

This biological interpretation consists in determining in each given psychosis which one of the great psychological functions, the alteration of which leaves its mark on the whole symptomatology, is involved.

One too often forgets that the processes of mental activity are *reactions*, that is to say, they are vital, biological processes, adapted to a certain end, which is useful either to the individual or to society. It is therefore necessary to ask, when we deal with a functional psycho-morbid phenomenon, whether this morbid phenomenon may not be an adapted reaction which had at its inception a reason for its existence, but which has become exaggerated or deviated from its normal function; and if such be the case, it is necessary to inquire which function it is that through its alteration has made it possible for the trouble to appear.

This biological interpretation has, one can see, the advantage of attracting the attention to questions which do not arise in the simple physiological cerebral interpretation of the morbid states. Such an interpretation alone, in fact, permits us to comprehend just *wherein* the process in question is abnormal, and in what sense it is abnormal, — whether by excess or insufficiency, while the purely analytical investigation (cerebral, physiological, or psychological) of the observed phenomenon tells us nothing of its abnormality. To refer a mental trouble to an inhibition, an amnesia, a fixed idea, is a matter of analysis, of description; such analysis is useful, — often, indeed, indispensable, — but

it hardly helps us any in the understanding of the disease: for inhibition, loss of memory, fixity in the orientation of ideas have, in themselves, nothing pathological; all these phenomena are to be found in the normal mental activity. In order to grasp wherein these phenomena are morbid, it is indispensable to resort to the biological interpretation.

This biological point of view has still another advantage: in making us look at matters from a more extended point of view, it enables us better to understand their relations. We can then more easily, if we have taken into account the biological significance of these morbid reactions, determine the order of the appearance and the sequence of these reactions, as well as the external or internal causes which produce them; we can then clearly perceive the tie which unites symptoms apparently so incongruous; in a word, one can trace the pathogenic evolution of the disease. Therepeutics will benefit by such knowledge; it is so much more easy to institute treatment (above all in cases amenable to moral treatment) when one has well understood the disease.

Let us take a few examples: I choose sleep as the first. Sleep, it is true, is not ordinarily an abnormal phenomenon. I, nevertheless, choose this example, because it shows, in a typical way, how much light the biological interpretation can throw on a subject until now considered as obscure. Moreover, the case of sleep serves as an introduction to the biological conception of hysteria.

Until now, sleep has always been considered from the exclusive point of view of the immediate physiological mechanism; this state has been regarded in turn as the result of asphyxia, of intoxication, of anemia of the nerve centers, of an ameboid retraction of the neurons, etc. Now from so narrow a point of view, one is unable to explain all the facts relative to sleep; the absence of parallelism between sleep and fatigue, the type of the periodicity of sleep, the suggestion of sleep, the possible postponement of sleep by interest or by volition, the variety of types of the sleep of animals, etc.

On the other hand, all these facts become clear as soon as one considers sleep from the biological point of view. Sleep now no longer appears as the result of intoxication, or of anemia of the nerve centers, but as an adapted reaction, as an instinct of foresight which has for its end, on the contrary, the prevention of the organism from reaching the state of exhaustion.[1]

Sleep is then, a reaction of defense. This reaction consists in an inhibition of the attention to the present situation. A being who sleeps is a being who is disinterested. But this inhibition, this distraction, is not passive, it is active; and like all the other instinctive activities of the organism, it is subject to *the law of the interest of the moment.* At each moment an animal accomplishes that act which is of greatest consequence to it, at the given moment. This explains the fact that sleep may (within certain limits) be postponed or supplanted by interesting occupations.

This point of view has not only the advantage of harmonizing with all the facts, but has the additional advantage of opening up to the study of sleep new horizons. If sleep is an instinct, it becomes legitimate to look for its phylogenetic origin, and one may then ask, At what step in evolution has it appeared? Sleep did not necessarily exist at all times; it is, in fact, a contingent phenomenon, and is not implied in the conception of life; the lower forms of animal life, microbes, infusoria, do not manifest any sleep. If sleep has developed, it is probably due to the fact that those animals whose activity was broken by periods of repose or of immobility have been favored in the struggle for existence, for they have been enabled, thanks to the accumulation of energy, during these periods of immobility, to manifest in consequence a more intense activity. As to these periods of immobility, they are themselves derived from the function of the inhibition of defense, which plays such a great rôle in the animal kingdom (simulation of death).

[1] For further details, see my work, "Esquisse d'une théorie du Sommeil," *Archiv. de Psychologie*, IV, Geneva, 1905.

This biological conception of sleep may serve as a foundation of a biological conception of hysteria, or, at least, of certain manifestations of that disease. Attempts have often been made to compare hysteria with sleep, and not without reason. The hysteric seems to be partially asleep. Unfortunately, the conclusion has been drawn from this comparison, that hysteria is the result of exhaustion, of intoxication (Sollier), but this does not explain the facts. On the contrary, the comparison between these two classes of phenomena becomes fertile when looked at in the light of the biological theory of sleep. Let us take, for example, hysterical anesthesia, or amnesia. It has been said that these phenomena resulted from distraction (Janet), which is perfectly true. But this is only the first step on the path of pathogenesis. What is the cause, the wherefore, of this distraction? Why this disinterest in events or memories manifested by the hysteric? The biological interpretation alone permits an answer to these questions. The study of sleep has taught us that the active distraction, the disinterest, was originally a reaction of defense. This hypothesis becomes fruitful if applied to hysteria. We shall, then, have to ask ourselves, *What is the significance of this hysterical distraction?* And whether it does not represent a reaction of defense which had its origin in adaptation.

Now, to state the question is to solve it. Repugnance is the cause of hysterical distraction. Repugnance, disgust, is one of the greatest functions of defense, perhaps the principal one, since this function has the important rôle of rejecting that which cannot be assimilated by the self, not only by the physical self (nutrition) but also by the psychological self. When an object or spectacle repels us we turn away the head, we expel it from our field of vision; when an idea is disagreeable or painful to us, we drive it from our consciousness, we turn away our attention from it, we become disinterested.

Hysterical distraction is thus homologous to a normal function. There is, nevertheless, a great difference between the hysterical and the normal reaction of repugnance.

This difference which, let us note in passing, can only be expressed in biological language, is this: in the normal man the inhibition from repugnance is subject to the law of the interest of the moment; that is to say, the inhibition ceases the moment that the interest which exists for taking the fact into consideration becomes greater than the interest of setting it aside. In the hysteric, on the other hand, this inhibition is exaggerated, excessive; it escapes the *law of the interest of the moment.* The amnesia and anesthesia persist even when it would be for the interest of the subject to integrate these perceptions or memories in the mental synthesis; it is a true psychic autotomy (*autotomie psychique*).

We thus see that, thanks to the biological interpretation which, in directing investigation to the altered function, enables one to compare it with the analogous normal function, we can put our finger directly on what constitutes the specific morbid character of the observed phenomena. In the case of hysteria we see that the essence of the morbidity is *the exaggeration of the reaction.*[1]

Naturally, the question, To what is this disposition to exaggeration due, still remains unexplained; but this problem is no longer in the province of psychopathology; it belongs to general pathology; it is the latter science that has to study the sources, hereditary or otherwise, of the neuropathic diathesis.

The same biological criterion helps us likewise to discern the factors which distinguish hysteria from sleep. Attempts have been made, as we have said before, to relate hysteria to sleep, both being states of distraction. Now a psychophysiological analysis does not at all indicate wherein these two kinds of distraction differ. Our biological criterion, on the contrary, helps us immediately to a clear understanding of the difference; while the distraction of sleep is

[1] Bernheim, in his recent memoir on the *Conception du mot Hystérie* (Paris, 1904), has also arrived at the conclusion that hysteria consists in an exaggeration of reactions. But I do not understand why this author considers the convulsive crises alone as belonging really to hysteria.

subject to the law of the interest of the moment, the hysterical distraction escapes that law.

The biological method may perhaps be applied with equal success to the study of certain psycho-therapeutic processes, notably the therapeutic action of confidence.[1] All clinicians agree on the importance of gaining the confidence of the patients. This confidence acts "like a real force," says Feuchtersleben. Each one of us can testify that, under diverse conditions, confidence gives strength, is dynamogenic. The question is to learn whence this energy comes, and what the means are by which confidence sets it free. Whence comes the energy of confidence? It is necessary again to appeal to the biological interpretation to discover it.

What is the biological function of confidence?

The instinct of preservation demands that the individual be always ready for the defensive, that he be always on his guard, even unconsciously. Not only must he defend his body against attack, but also his mind against error. Fortunately, this function of control has, as its antagonist, the function of confidence. In practice, indeed, it is impossible to verify everything; if we possessed the instinct of control alone, life would be for us an actual hell. We would doubt everything, never be sure of anything, and would never arrive at any action.[2] The obsessed, afflicted with "*folie du doute*," are patients in whom the instinct of control is excessive, or in whom the antoganistic instinct, confidence, confidence in others, confidence in the testimony of the sense and memory, is lacking.

However great, indeed, our interest in personal verification may be, it is kept in check by a still greater interest, that of economizing our efforts. Evolution has favored

[1] Ed. Claparède: "Sur le mécanisme du facteur confiance en psychothérapie," *Revue médicale de la Suisse romande*, April, 1905, p. 306.

[2] In their interesting work, *Isolement et Psycho-thérapie* (Paris, 1904), Comus and Pagniez have devoted a chapter to confidence, which they consider as an act of abandonment. But, not having placed themselves on biological ground, they cannot explain the reasons of this act of abandonment.

those who knew how to profit not only by their own personal experience, but also by that of others, who knew how to turn into account the testimony of others, to act by imitation; in a word, to have confidence. We see that confidence is as indispensable a function to our life as is control.

We are now in a position to understand the beneficent influence of confidence in psychoneuroses. A neuropath is most often a being who mistrusts himself, who shrinks and inhibits himself; in a word, one who strains his reflexes of defense. Confidence, which is the antagonist of this mental defense, acts in relaxing these reflexes of defense; at the same time it sets free the energy which had been stored up, potentialized by the activity of defense. This available energy, this energy in a nascent state, can then be usefully employed in the physical or psychic re-education of the patient.

There has been much discussion as to the difference between *suggestion* and *persuasion*. Certain authors consider these phenomena as absolutely different in their nature; others (Bernheim, for example) identify them completely. These discussions are absolutely sterile, for the answer to the question depends entirely upon the point of view one takes. If one adheres to the ordinary psycho-physiological point of view, it is impossible to state exactly wherein these two categories of phenomena differ. One cannot make a quantitative difference, and say, for example, that suggestion is a very strong belief. A very strong belief is not a suggestion if that belief is adapted, is of use to the individual, and has a biological reason. Here again one must bring in the biological criterion. It is only with such aid that we can see the distinction between suggestion and belief; belief is a normal fact because it is subordinated to the interest of the individual; suggestion, on the contrary, is abnormal because the relaxation of mental defense, which characterizes it, persists even when it would be for the interest of the subject to exercise his function of control in regard to the assertions which are made to him.

Suggestion is to persuasion what hysterical inhibition is to repugnance, — an abnormal exaggeration of a normal function.

There are many other psycho-pathological questions which would become clear if one approached them from the biological point of view. Take, for example, the *logorrhea*, the incontinence of ideas in maniacs and other insane patients (*Ideenflucht*). Certain authors have tried to account for this logorrhea by invoking an acceleration of the associative processes (Ziehen) or a greater readiness of the psycho-motor processes (Aschaffenburg). But these are explanations which explain nothing. To account for the incoherency of thought which is the special characteristic of the *Ideenflucht*, it is necessary to look deeper; it is necessary to descend to the biological sources of mental activity. It will then be seen that that which characterizes a coherent thought is its being adapted to the interest of the individual at the given moment. In a normal individual, the ideas, logical relationship, etc., corresponding to the interest of the moment, ought alone to be dynamogenic and cross the threshold of consciousness.[1]

When the thought is incoherent, it signifies that the function of interest for the given situation is insufficient, or is altered.[2]

I should like to cite, as a last example of the usefulness of the biological interpretation, the phenomenon of the *illusion of weights*, and the absence of this illusion in abnormal subjects. Every one knows that of two objects of the same weight but of different volume, the one of the larger volume will appear the lighter. This illusion is quite general, and it is impossible to escape it. Demoor

[1] Compare my communication to the Psychological Congress in Rome on " L'intérêt, principe fondamental de l'activité mentale " (summarized in the *Revue philosophique* for July, 1905, p. 70).

[2] Liepmann, who has just published an excellent study on *Ideenflucht* (Halle, 1904), has recognized that the phenomenon consists in a maladaptation; but he relates it to a trouble of *attention*. It seems to me that there is a little confusion in the matter. Attention is but one of the possible manifestations of interest and it ought not to be identified with the function of interest itself.

(of Brussels) has discovered, however, that certain abnormal children are free from this illusion. I have myself carried on some investigations in this field, and have been able to confirm the absence of this illusion of weights among the abnormal, a sign which I have proposed to designate by the name of the "Sign of Demoor."[1] How explain this bizarre result? Various explanations have been offered, but the theory which Flournoy has advanced, which makes an appeal to biological concepts, is the only one which makes the phenomenon intelligible: "By virtue of hereditary experience," says Flournoy, "the unconscious cerebral impulse proportions itself automatically to the probable weight, and consequently, all things being equal, to the visible volume of the body we are going to raise; on account of this, a greater speed is communicated to larger objects, from which results their apparent lightness."[2] This theory of motor adaptation — the truth of which I have been able to verify by demonstrating, by the graphic method, that the weights are actually raised with greater rapidity the greater the volume[3] — this theory explains at the same time why the illusion does not exist among the abnormal. Abnormal children are degenerates, and the degeneration consists in the dissolution of instincts, in the loss of useful adaptations. It is probable that among the abnormal, this function of automatic adaption of which we have just spoken has not been transmitted by heredity. This is only an hypothesis, it is true, but it harmonizes perfectly with all the known facts, while all the other purely psychological explanations offered for the illusion of weights do not have this advantage.

These examples show sufficiently, I believe, how fertile

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[1] Demoor: "Notes médico-pédagogiques," *Journ. médicale de Bruxelle*, January 18, 1898.

Ed. Claparède: "L'illusion de poids chez les anormaux et le Signe de Demoor," *Archiv de Psychologie*, II, 1902.

[2] Flournoy: *Année psychologique*, I, 1894, p. 198.

[3] Claparède: "Expérience sur la vitesse du soulèvement des poids de volume différent," *Archiv de Psychologie*, I, 1901, p. 68.

may be for psychopathology the biological interpretation of the phenomena with which this science deals.[1]

If we summarize briefly what has preceded we are able to formulate the following conclusions:

1. The biological interpretation alone enables us to see whether a mental phenomenon is normal or abnormal, and allows us to determine exactly what characterizes the abnormality of the phenomenon.

2. In furnishing in given cases the significance of the observed trouble, the biological interpretation enables us to reconstruct the sequence of the morbid phenomena, to recognize the origin of the disease and the causes, external or internal, which produced it, and consequently to institute rational psychic treatment.

Let us add that normal psychology could not but profit from a biological orientation of psychopathology. Normal mental activity is the resultant of the coöperation of a large number of autonomous functions. But under normal conditions it is impossible to perceive, to distinguish, to isolate, each one of these multiple functions. That which psychological analysis cannot accomplish is accomplished by disease. We can learn to recognize the isolated play of each one of these functions, if we study the pathological conditions in which one of them has altered. But in order to ascertain this alteration of the great psychological functions it is indispensable that abnormal psychology consider these mental phenomena from the biological point of view.

[1] Let us recall how P. Janet, in trying to determine which are the functions which are altered in psychasthenia, has cleared up the psychopathology of that disease (*Les Obsessions et la psychasthénie*, Paris, 1903). At the recent congress of French neurologists at Rennes, Professor Brissand brought forward the view that hypochondria is due to a failure of the function of security, a function which would itself have as a condition the proper functioning of the various organs. I believe that such a view is very fertile, since it permits us to assume that the cause of hypochondria may be either peripheral or central in the reaction of security. This biological conception unites and conciliates the two opposing theories (psychic and peripheral) of this disease.

ABSTRACTS.

1. *The Motor Area of the Human Cerebrum; Its Position and Subdivisions, with Some Discussion of the Surgery of this Area.* C. K. Mills, M.D., and C. K. Frazier, M.D., "University of Pennsylvania Medical Bulletin," XVIII, 134, 1905.

2. *The Significance of Jacksonian Epilepsy in Focal Diagnosis, with Some Discussion of the Site and Nature of the Lesions and Disorders Causing this Form of Spasm.* Charles K. Mills, M.D., "Boston Medical and Surgical Journal," CLIV, 453, 1906.

The first paper, by Mills and Frazier, represents the results of original work. Following a brief historical sketch of the electric stimulation of the human brain, several early cases are reported in some detail. Keen, in 1888, after locating the central fissure, was able, by stimulation, to determine the centers for various movements of the hand and fingers, and of the face, shoulder, and elbow, all being placed probably cephalad to the fissure. Cases of Lloyd, of Mills, and of Hearn also showed that the motor areas were cephalad of the central fissure. The importance of these cases was that the motor representation was shown to lie essentially in the precentral region.

Ten personal new cases are reported, in which it was possible, during life, to stimulate the cortex for the purpose of discovering the localization of motor function. The first case was a tumor lying across the posterior portion of the first and second frontal convolutions. Stimulation forward of the central fissure gave various responses of the head and eyes. The second case, a boy of eleven, had epilepsy with dural adhesions. Results of stimulation were doubtful. The third case, a girl of seven, with traumatic epilepsy, gave responses from stimulation anterior to the fissure. The fourth was a similar case, with similar results. The fifth case was a man of thirty-two, with brain cyst or tumor. Strong currents behind the central fissure produced convulsive and extensive response of the upper extremities. The sixth case, a girl of nine: adhesions over the face area. Six applications, both before and behind the fissure, gave no response. The seventh case, a boy of fourteen, was shot in the left temple. An area posterior to the fissure was alone stimulated, with no

response. In the three succeeding cases, studied with Keen, there was in the first no response from the postcentral convolutions; in the second (epilepsy following a skull fracture) a very slight contraction of the left hand and the left leg was obtained by stimulation in the immediate neighborhood of the central fissure. In the final case stimulation of the leg area appeared to show that this center is close to the mesal line, and probably entirely in front of the central fissure.

An analysis of the results of faradic stimulation in a series of twenty-five cases with one hundred and thirty-eight applications, showed responses from the cortex in front of the central fissure in sixty-two; behind in twenty; in uncertain positions in relation to the central fissure, fourteen; no response in front, fourteen; no response behind, twenty-eight. In general, these observations are in favor of the view that the motor region lies ventral to the central fissure.

The best practical division of the motor zone is to regard it as precentral and subdivided into four parts. From below upward three of these parts are occupied by the face and arm areas, and the upper fourth by the trunk and leg areas, the former occupying mostly a narrow strip, and the latter having also a representation on the mesal aspect of the brain. The area for the upper extremities is the largest of the main divisions of the motor zone.

The importance of accurate technique in faradization of the cortex is insisted upon. The standard bone flap, also studied on the cadaver, should be made two thirds of an inch in front of, and one third of an inch behind, the central fissure to best uncover the motor area. The stimulating electrode should be dull and not larger than the head of a pin, and the indifferent electrode should always be placed on the same part of the body. A definite current strength should be used, and weak currents are preferable in order to avoid the danger of diffusion and a consequent masking of results. A unipolar application is probably more satisfactory than the bipolar method.

The paper is concluded by a discussion of craniometric lines and craniocerebral relations.

Dr. Mills adds, in the second of the above papers, another significant contribution to his work on cerebral localization. Dr. Mills uses the term "Jacksonian epilepsy" as meaning monospasm or hemispasm due to cortical or cortico-subcortical discharge

usually exhibiting an initial symptom and a serial order of phenomena. By far the larger number of cases of so-called Jacksonian spasm are due to irritation or instability of portions of the motor area, but by no means always due to gross lesions of this area. It is desirable, therefore, not to attribute erroneous diagnostic value to localized spasm. Dr. Mills quotes several interesting cases which he has observed in connection with various surgeons, in several of which a successful operation was performed. These cases illustrate particularly the significance of Jacksonian spasms in gross lesions of the cortex. As warnings to the diagnostician it is suggested that tumors situated in other parts of the brain than the motor cortex may cause Jacksonian epilepsy; that other lesions beside tumors situated in the motor cortex may cause this form of spasm; that it occurs in toxic and other disease in which no demonstrable focal lesions are present; that a spasm closely counterparting the Jacksonian type may be observed in a reflex or an hysterical disorder; and, finally, that Jacksonian epilepsy may be simply an integral part or the entire expression of a case of idiopathic epilepsy. Cases illustrative of these points are discussed in some detail on the basis of personal experience and that of others. It is further pointed out that gross lesions of the motor area may cause monospasm or hemispasm, simulating that produced by neoplasm, by depressed fractures, localized meningitis, meningeal or cortical hemorrhage, focal hemorrhagic encephalitis or cortical polioencephalitis and focal necrosis from embolism or thrombosis inclusive of the effects of general arteriosclerosis. An important discussion regarding differential diagnosis with a further report of cases completes this important contribution.

TAYLOR AND WATERMAN.

Ueber das Verhalten der Reaktionszeit beim Assoziationsexperimente, Habilitationsschrift. By C. G. Jung. Ambrosius Barth. 38 pages (Zürich), Leipzig.

Experimentelle Beobachtungen über das Erinnerungsvermogen. By C. G. Jung, "Centralblatt für Nervenheilkunde und Psychiatrie," September 1, 1905.

Zur Psychologischen Tatbestandsdiagnostik. By C. G. Jung, "Centralblatt für Nervenheilkunde und Psychiatrie," November 1, 1905.

The recent studies of Jung on associations deserve the

closest attention of psychiatrists as well as psychologists. Jung has demonstrated, to state at once his most important contribution, that by means of association experiments the existence of complexes of ideas to which strong feelings are attached can be discovered, and he has made clear some of the influences which such complexes may have upon mental processes. The value which such studies must have upon questions of individual psychology and upon psychopathology is obvious. Some of the results represent, one might say, an independent discovery, from a different direction, and with simpler methods, of the valuable observations of Freud, to whom Jung frequently refers with full appreciation of his work. Through these studies of Jung the association experiment has become an extremely valuable method, not only for scientific investigation, but for practical clinical analysis as well.

His earlier contributions were published in the "Journal der Psychologie und Neurologie," and were reviewed by Adolf Meyer in the June number of the "Psychological Bulletin," of 1905.

In the first paper considered in the present review, certain peculiarities in the *reaction time* of the association experiment are considered. Jung uses in his experiments a watch indicating one fifth of a second, and his results amply justify his reasoning, that, since there are still large variations in reaction time which await elucidation, it is unnecessary to employ complicated apparatuses before these larger variations are sufficiently cleared up. It was found that the reaction time of men is shorter than that of women, while the association times of the uneducated were longer than those of the educated persons. The nature of the stimulus word was found to have some influence, inasmuch as words expressing concrete things elicited quicker reactions than general concepts; adjectives quicker ones than verbs. In the same way the reaction-word influenced the association time: general concepts came slowest; adjectives quickest. Again the quality of the association had an influence. External associations were quicker than internal, but also quicker than sound associations; indeed in most of the educated men the sound associations were often longer than the internal associations, whereas in women they were slightly shorter.

In a previous study, Jung had found that sound associations are often the outcome of a disorder of attention (hence their

frequent occurrence in states of flight of ideas); he now showed that they *may* be due to a special kind of internal distraction, namely: to the fact that the stimulus word has "touched" a "complex of ideas" associated with a strong feeling tone. This, together with other similar phenomena, above all, the lengthening of the reaction time depending upon the same psychological mechanism, is then taken up. The complexes which here come into question are usually associated with feelings of an unpleasant nature, and erotic complexes play an important rôle.

A very instructive analysis of the nature of the associations and of the association time is given for a number of cases, notably that of an educated woman. It was found that when the association time exceeded the probable mean of that person, this frequently depended upon the fact that the stimulus word had "touched" the following complex: The subject, a newly married woman, was pregnant; this fact was, in her mind, associated with feelings of anxious expectation, more especially with some jealous fears lest the husband's affections might become cooled by the pregnancy, etc. In comparison with this "erotic" complex, other slighter ones were more in the background. The probable mean of the association time of the subject was one second. In 30.5% of all the tests the time was prolonged. In 20.5% it measured 1.2 seconds, among these 32% depended upon the complex mentioned; 6% measured 1.4 seconds; of those, 75% depended upon the complex; 3% measured more than 1.4 seconds, and all those depended on the complex. Only in rare instances was the subject conscious of the cause of this retardation, indeed, often not conscious of any retardation at all; and the cause was discovered only by a careful subsequent analysis. These analyses may in places strike one as somewhat forced; and yet, if one goes over the studies of Jung carefully, I think one cannot help feeling that his conclusions are sound. There were a few obvious associations in which the subject at once became very clearly conscious of the complex; the same occurs in cases in which the feeling tone associated with the complex is very strong, and consequently the complex unusually prominent in the subject's mind. But the interest in the subjects described here lies in the fact that the complexes were not at all prominent, — a fact which leads Jung to the far-reaching conclusion that, after all,

the unconscious factors in the mental mechanism have a very strong influence upon associations, and that our thinking and acting are determined by innumerable factors which lie outside of consciousness, because mind and consciousness are not co-extensive. The other two instances which he studied were very similar, though instead of one prominent complex there were a number of lesser ones.

In addition to the slowing effect upon the immediate reaction, the influence may also extend over one or two or even more of the subsequent reactions. Another feature caused by the same mechanism was certain peculiarities in the nature of the associated words; that is, the complex determined incomprehensible reactions, superficial associations, a mere repetition of the stimulus word, translations, etc. Where such peculiarities appeared it could be demonstrated that a definite complex had been "touched." Jung calls these peculiarities "indications of complexes" (*Complex-Merkmale*), and he found later in his pathological studies that these indications are the same in the normal and in the pathological cases. It is obvious what a valuable contribution this is for the study of psychopathology. (See also Ricklin, "Ueber die diagnostische Bedeutung von Associationsuntersuchungen bie Hysterischen." "Centralblatt für Nervenheilkunde und Psychiatrie," August 15, 1904.)

The second communication of Jung is a direct continuation, in a special line, of his former work.

Jung and Ricklin claimed, like Freud,[1] that every hysterical patient has a "displaced" (more or less forgotten) complex which causes the disturbance. (See more especially the excellent analysis of the case of Lina H., which Ricklin published in the "Psychiatrisch-Neurologische Wochenschrift," 1905, numbers 46 to 52, and which was reviewed by Adolf Meyer in the "Psychological Bulletin" of July, 1905.) They find that, when in the association experiments on hysterical subjects the stimulus word touched such a complex, the subject did not react for a long time and finally asked what had been said; indeed it was evident, as was brought out by subsequent questioning, that the word was forgotten; this then was a part of the general tendency present in these patients to "forget," or to "displace" disagreeable impressions.

The psycho-analytic method which Freud uses for the demon-

[1] See page 101, review of Freud's *Psychopathology of Everyday Life.*

stration of such complexes in hysteria and other conditions is cumbersome; consequently it is exceedingly valuable to have a method by which such displaced complexes may be discovered, and the association experiment, as developed by Jung, furnishes an excellent method for this purpose. It is obvious that if we collect the stimulus words which give rise to any "indications of complexes," we shall be able to draw some conclusions about the nature of the complexes, and we may penetrate further by adding new stimulus words, which, to judge from the experiences, would be likely to give more specific indications.

In the present paper Jung adds a special modification to his method which furnishes additional objective data for the demonstration of complexes, even where the subjective analysis is impossible. Instead of going only once through the association experiment (consisting of 100 words) he went over the same words a second time in order to see whether there was any evidence of influences of complexes in the cases in which the reproduction of the first reaction was wrong. He found that preëminently those reactions were forgotten which in the first test presented peculiarities, and in which the analysis demonstrated the influence of complexes. Thus, in one case he found thirty-eight incorrect reproductions; in only five of these was it impossible to demonstrate the influence of a complex, and even they showed a lengthening of the reaction time in the first test. In another case the average of the association times in which the associated words were later wrongly reproduced was five seconds, whereas in the tests in which the reproductions were correct the average time was three seconds.

These results, if generally confirmed, show that this reproduction method is another means for the objective demonstration of complexes, and they give us an insight into the important question of the influences of feelings upon memory.

The influence of such idea complexes which have a strong feeling tone is very extensive. It is found in the normal, in hysteria, and in dementia praecox. Jung summarizes his views upon these influences, at the end of his paper, in the following manner: "In the normal we find a brief embarrassment, or 'momentary inhibition'; in hysteria, one of the so-called 'voluntary' amnesias; in dementia precox, the phenomenon of 'blocking' (*Sperrung schlechthin*), but the psychological mechanism in all is the same." His reference to dementia

precox is based upon studies not yet published, work which was commenced by Professor Bleuler, and further elaborated by Jung and Ricklin. The only publication which permits us to have some insight into the results of this work is the very suggestive paper by Ricklin upon the improvement sometimes found in dementia precox cases after transference to different surroundings ("Ueber Versetzungsbesserungen," "Psychiatrisch-Neurologische Wochenschrift," 1905. numbers 16, 17, 18). But the paper goes far beyond this, and gives many very interesting suggestions for the psychopathology of dementia precox, based, evidently, in great part upon association studies. There seems to be little doubt but that we may expect much elucidation along this line in the difficult analysis of dementia precox.

In his third communication Jung finally calls attention to an article published in the "Archive for Criminal Anthropology" in which practically his method is advocated for the sake of discovering crimes. He emphasizes his priority, which is all the more justifiable since he has not only developed the method, but had himself spoken of the possibility of discovering crime by this means. He then reports a case of a young man who was accused of having stolen some money from his guardian, and in whom Jung found by means of the association method such clear evidence of a guilty conscience that he did not hesitate to tell him frankly that he had stolen the money, whereupon the man broke down and confessed.

HOCH.

REVIEWS.

The Psychopathology of Everyday Life (*Zur Psychopathologie des Alltagslebens*). By S. Freud. S. Karger, Berlin, 1904.

The perennial interest in the psychology of dreams has received a further stimulus in the little volume by Freud, whose previous work in the same field is already well known. Amplifying the idea contained in many of his papers, and more especially in his "Traumdeutung" (Vienna, 1900). Freud enters upon an analysis of the mechanism and an interpretation of the meaning of dreams, whose *fons et origo* he believes to be in subconscious mental life. The dream, in Freud's view of it, is a manifestation of motives and desires, temporarily suppressed and submerged in the subconsciousness. There is an upper primary consciousness, — a censor, as it were, — which prevents these suppressed states, these motives and desires, from rising to the surface. When in sleep, however, the upper consciousness is more or less in abeyance, such suppressed states assert themselves, but not without having previously undergone a metamorphosis, — hence the bizarre and oftentimes fanciful fabric of our dreams. Upon careful analysis, — a task not always easy, — each element of the dream can be traced to co-existing subconscious states.

This mechanism of the dream is not by any means unique, for it is similar to what we observe in the various forms of the psychoneuroses, hysteria, etc. A similar mechanism is shown to exist in the normal mind, manifesting itself in certain familiar processes of our daily life, such, for example, as the forgetting of well-known names, slips of tongue and pen, the forgetting of important events which should be remembered, certain motor maladjustments, and apparently accidental and purposeless actions, none of which is merely fortuitous, since it is the expression of dominant suppressed motives. In our psychic life there is nothing arbitrary; no chance elements are to be found there, and all mental activity is predetermined by subconscious states.

The motives causing suppression of certain mental states are to be sought in moral training, in social environment, or in the painful nature of the states themselves. These suppressed

states do not remain dormant, they will not down, but force themselves above the conscious threshold, the occasion of their manifestation being an association existing between them and the conscious content of the moment. Such suppressed states during their manifestation interfere with the processes of consciousness and hence the resulting activity is a " compromise " between the two opposed states. The forgetting of a familiar name, for example, and the birth in the mind of many names which are immediately rejected, — a common occurrence, — is not a matter of mere chance, but is fraught with meaning. Freud analyzes at length several instances of this sort and shows that at the time the name is forgotten, there are present in the mind certain states which we voluntarily suppress because of their disagreeable nature. When the name together with these states is suppressed, it is because of an association between such states and the name in question. The names, moreover, which occur to the mind when we seek for the forgotten name, are not merely names of chance, but are " compromises " between what we endeavor to recall and what we suppress; they contain elements of each.

The conditions underlying this process are the following:

First, a certain disposition to forget the name.

Second, a very recently executed process of suppression.

Third, the existence of an association between the suppressed state and the name.

In a similar fashion the forgetting of important events can be traced to a voluntary effort of suppression, for there is an universal tendency, varying with individuals, to forget unpleasant experiences. Here is a striking example from Freud's personal experience. While looking over his account books, he came upon a name which he did not recognize. Neither could he recall the patient, although his books showed that treatment had been recent and of long duration. Evidently there was some motive for his forgetting the name. Subsequently the patient proved to have been a young girl whom he had treated for hysterical symptoms, with great improvement in her condition. A short time later the girl died of sarcoma of the pelvic organs, which the nervous symptoms had concealed and hence the organic disorder was overlooked. This was naturally a very unpleasant experience, and therefore the extraordinary loss of memory for such an important case.

Freud analyzes many cases of such familiar instances as slips of the tongue, maladjustments, and accidental and purposeless acts, all of which he interprets as manifestations of subconscious motives.

The subconscious is thus shown to exert a great influence upon normal mental life. In our psychic activity is nothing without import, and indeed it is impossible to make a meaningless combination. When, for example, we think of a chance name or of a chance number, the name or number that occurs to the mind will, on analysis, be found to be determined by motives which are entirely outside the field of consciousness.

Thus we observe the processes of normal life to be similar to those of dreams and the various psychoses. Between the normal and the abnormal there is no gap, the transition is gradual and imperceptible. Although perhaps not quite convincing, this little volume is interesting and timely.

SIDIS.

The Localization of Cerebral Function. By Alfred W. Campbell, M.D. University Press, Cambridge, 1905, pp. 348 and plates xxix.

It is peculiarly fitting that the scholarly volume before us should have been published by an Englishman, and we congratulate Dr. Campbell upon the completion of a work which represents, as it were, the consummation of British researches upon cerebral localization inaugurated many years ago by Hughlings Jackson, Ferrier, Bastian, and Broadbent. Opening the volume one who has a penchant for literary values is impressed immediately by the felicity of the style with which the author has clothed his scientific facts, and this literary excellence, — only too rare in medical writing, — renders doubly interesting reading the three hundred odd pages which the book comprises. Moreover, from the methodological point of view, there is a sequence of thought and a coherence in its presentation which are altogether admirable. These characteristics are, indeed, in a certain sense, extrinsic, but we commend them because of our firm belief in the importance of literary culture even in scientific works.

The general purpose of Dr. Campbell's labors has been the histological study of the cerebral cortex relative to regional variations of cell lamination and fiber arrangement, and the

correlation of such variations with diversity of function. While this has been his original contribution to the subject, he has, at the same time, marshaled the collateral evidence as furnished by comparative anatomy, experimental physiology, embryology, and clinical pathology, so that in reality the book becomes a critical commentary upon cerebral localization.

Having given us an introduction on the methods of histological research, and having devoted the first two chapters to the material and the method of its examination, together with some general remarks on cell lamination and the arrangement of nerve fibers in the cortex, the author describes in subsequent chapters the precentral or motor area; the postcentral or sensory area and the intermediate postcentral area; the visuo-sensory and the visuo-psychic areas; the temporal lobe and the auditory areas; the limbic lobe; the parietal area; the intermediate precentral area; the frontal and prefrontal areas, and the island of Reil. In an addendum he presents some further histological studies on the localization of cerebral function, the brains of *felis*, *canis*, and *sus* being compared with that of man. In each chapter we discover evidence of intimate acquaintance with the voluminous literature of the subject, combined with a critical attitude toward his own and the work of others, which makes the book in every sense a most conservative, sane, and trustworthy account of the present position of cerebral localization.

The material for the work is divisible into three categories; namely, normal human, normal comparative, and pathological. The normal human material consisted of three cerebral hemispheres completely examined for both nerve cells and nerve fibers, three hemispheres completely examined for fibers only, and two hemispheres partially examined for nerve fibers and nerve cells, the ages of the individuals varying from nineteen to forty-eight years. The normal comparative material comprised the right cerebral hemisphere of a chimpanzee, the left hemisphere of another chimpanzee, and the right hemisphere of an orang; while the pathological material consisted of two brains from cases of amyotrophic lateral sclerosis, seven from cases of amputation of one or other extremity, three from cases of tabes dorsalis, and one from a case of old standing capsular lesion. It is upon this varied material that the author bases his histological conclusions.

In view of the controversy that has obtained for years regard-

ing the precise delimitation of the motor area in the Rolandic region, the researches of Dr. Campbell are of especial importance. Writing in 1901, Professors Sherrington and Grünbaum published their account of some experiments conducted upon all the known species of anthropoid apes, and expressed their belief that the prevalent views upon the topography of the motor region needed extensive modification. Using electrical stimulation they demonstrated that the responsive area was confined to the precentral convolution and a small portion of the paracentral lobule, and did not include the postcentral convolution, as had been previously maintained by many. The brains of some of these anthropoids were examined histologically by the author, and the result of his precise observations appears to be that it is just as possible to define the motor area by this method as by electrical stimulation. Pursuing the same method of examination of the cortex in the cases of amyotrophic lateral sclerosis and amputation of one or other extremity, his conclusions are that it is possible, by noting the changes in the large pyramidal cells of Betz, to mark out with surprising accuracy the motor cortex. And furthermore, by studying the affected cell groups, the probable area of representation of the different segments of the extremities was defined. From the combined results of these diverse evidential facts, Dr. Campbell concludes with Sherrington, Grünbaum, and Mills that the motor cortex is situated entirely cephalad of the Rolandic fissure; he goes further and states that "it is impossible to reconcile these findings with the long list of clinical observations adduced in the past to support the view that the two central convolutions have an equal share in the control of volitional movements, and it is suggested that natural lesions, such as cerebral softening, cerebral tumor, and cerebral trauma, which form the basis of most of these observations, are only, in rare instances, sufficiently limited in their effects to allow of safe judgment on this question; hence, errors have arisen."

Such statements as these are, of course, contradictory of generally accepted views, but in face of the cumulative evidence, there would seem to be no other way open to us than to regard the Rolandic fissure as the posterior boundary of the motor zone. When, furthermore, the postcentral convolution was examined, the findings became strikingly confirmatory, for not only was the cell-lamination and fiber arrangement found to be

quite different from those of the precentral convolution, but a very painstaking examination of this part of the cortex in cases of tabes dorsalis and in a case of old standing capsular lesion showed, beyond peradventure, definite alterations in the cells of this region. The trend of argument throughout the author's treatment of this part of his subject is directed toward proving that the postcentral gyrus constitutes the terminus where the main system of fibers for the conveyance of impressions pertaining to tactile and allied forms of common sensation primarily impinges. As a result of his histological findings, Dr. Campbell becomes a strong ally of those who maintain that the Rolandic region, instead of being everywhere sensorimotor, is divided by the central fissure into two functionally distinct areas, the anterior being purely motor, the posterior purely sensory.

It would be interesting and well worth while, did the exigencies of our space permit, to follow the author in his description of the other cortical areas, each of which is treated from the histological, embryological, and pathological aspects. It must suffice to say that in the occipital lobe he describes what he distinguishes as a visuo-sensory and a visuo-psychic area, and observes that from an histological point of view there is found investing his visuo-sensory area a moderately extensive field of cortex, possessing a specialized type of arrangement of nerve fibers and nerve cells entirely different both from that in the visuo-sensory area and that in the more outlying parts. If it be granted that the calcarine area is solely devoted to the reception of primary visual stimuli, the mere existence of a second area placed in such immediate contiguity suggests the possibility that it is concerned with the sorting out and further elaboration of these stimuli.

In the temporal lobe there is an histological basis for the division of the region into a common audito-sensory and audito-psychic area, the latter having for its function the further elaboration of impulses received in the former.

Concerning the limbic lobe, the author states that histology supports comparative anatomy in suggesting that, in the human brain, the lobus pyriformis must be regarded as the principal cortical center, although not the sole one, governing the olfactory sense. On the other hand, definite information regarding gustatory localization in the cortex cerebri is wanting.

Adding histological confirmation to the conclusions of clinical medicine as expressed by Durante, Walton and Paul, Von Monakow, Redlich, and many others, Dr. Campbell agrees that the "parietal area" which he maps out represents a high sensory center, a center for the recognition of complex impressions embodied in the muscle sense and in that of stereognosis.

One of the most interesting areas of the brain, as evincing the relation between variation of structure and diversity of function, is that which the author terms the "intermediate precentral," because structurally its type is transitional between the precentral and the frontal cortex. Accepting the hypothesis of the different evolutionary levels first proposed by Hughlings Jackson, Dr. Campbell observes that, in his opinion, the "intermediate precentral" cortex forms a very important part, though not, of course, the whole of "the highest or third level." "I am of opinion," he says, "that this particular stretch of cortex is specially designed for the execution of complex movements of an associated kind, of skilled movements, of movements in which consciousness or volition takes an active part, as opposed to automatic movements"; and in this area are placed by him the graphic center and Broca's motor-speech center. Again it will be noted that a careful study of the subject reveals the important law that in the "intermediate precentral" cortex there is a sequential deposition of centers for the control of higher evolutionary movements, following the same order from above downwards as that observed in the precentral or motor area proper. There is the highest probability that corresponding centers in each area are associated by commissural fibers, and that corresponding centers lie approximately on the same level, and at all events in juxtaposition.

In his discussion of the frontal and prefrontal areas the author states that it is a region the functions of which are but little known. "It is a part where theory holds the major hand, one which has proved most resistive to workers in the several departments of experimental physiology and pathology, clinical medicine, embryology, anatomy, and histology, both human and comparative, and about which the little knowledge that we do possess has been acquired only by negative and roundabout processes of reasoning; further, as others have rightly observed, it is a realm where localization, in so much as this applies to the definition of fields having a specific function and

a specialized structure, seems unattainable." Such restraint as this is commendable after one has had something too much of the naive manner in which the relations between the frontal lobes and the higher psychic activities have often been discussed. To recognize the limitations of a method is often a most salutary thing. It saves many a leap into the dark, and Dr. Campbell's conclusions relative to the frontal lobe are but another evidence of that critical acumen which is obvious throughout his work. While he properly admits the general relationship between the frontal lobes and psychic processes, he refrains from further statements regarding them, and disclaims for the microscope any great service in elucidating this complex problem.

Obviously it would be impossible within the limits of a review to compass all the excellence of this work. Seeing its necessity, the author has begun from the beginning, and having collected the scattered and disjointed knowledge of cerebral localization, he has given us a research upon the structure and function of the brain which is a monument to his industry and learning, and an inspiration to those who read it.

DONLEY.

BOOKS RECEIVED.

A TEXT BOOK OF PSYCHIATRY, for Physicians and Students. By Leonardo Bianchi, M.D., Professor of Clinical Psychiatry and Neuropathology in the Royal University of Naples, etc. Authorized translation from the Italian by James H. Macdonald, M.B., Ch.B. (Glasc.), Senior Assistant Physician to the Govan District Asylum. With 106 illustrations. Cloth. Pp. 904. Price, $6.00. New York. William Wood & Co. 1906.

ENIGMAS OF PSYCHICAL RESEARCH. By James H. Hyslop, Ph.D., LL.D. Cloth. Pp. 427. Price, $1.50. Boston. Herbert B. Turner & Co. 1906.

CRIMINAL RESPONSIBILITY. By Charles Mercier, M.B., F.R.C.P., F.R.C.S., Lecturer on Insanity at the Westminster Hospital Medical School, etc. Cloth. Pp. 232. Oxford. Clarendon Press. 1905.

THE SUBCONSCIOUS. By Joseph Jastrow, Professor of Psychology in the University of Wisconsin. Cloth. Pp. 549. Price, $2.50. Boston and New York. Houghton, Mifflin & Co. 1906.